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A service evaluation of prescription medication reconciliation in the Emergency Assessment Unit: staff perceptions and actual waiting times

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Abstract

Failure to speedily reconcile regular medications in the emergency assessment unit (EAU) of a hospital can cause delays to treatment leading to deterioration of patient conditions, contribute to patient distress and lead to complaints. In this service evaluation, we surveyed 30 staff within the EAU of a busy teaching hospital on their perceptions of prescription reconciliation. In addition, we recorded waiting times between admittance and regular medication reconciliation for all 263 patients admitted to the EAU over the month of December. While 40% of staff responded in the survey that the unit was efficient in resolving medication prescriptions, 90% believed the unit could improve. There was considerable variation in the reconciliation times from seven minutes to almost 24 hours. However, most prescriptions (82%) were resolved within six hours. We make recommendations aimed at reducing prescription reconciliation times for EAU patients.

Background

Emergency assessment units (EAUs) provide early assessment and treatment for adults referred from a hospital Accident and Emergency department, Ambulatory Care or by general practitioners. At arrival to the EAU, patients are admitted by nursing staff and receive an assessment by medical staff. At this point, treatment is initiated. When a patient's treatment becomes stable and therapeutic, they will be allocated to a specific ward or department for ongoing care.

At the Trust where the project took place, the junior medical team (Foundation Years 1 and 2) are responsible for gathering a patient's full medical history, medical assessment including reason for admission as well as full medication reconciliation. Medication reconciliation is described by the Institute for Healthcare Improvement as;

the process of creating the most accurate list possible of all medications a patient is taking — including drug name, dosage, frequency, and route — and comparing that list against the physician's admission, transfer, and/or discharge orders, with the goal of providing correct medications to the patient at all transition points within the hospital (Institute for Healthcare Improvement 2011).

All medications a patient is currently taking, including prescribed and over the counter or herbal remedies, are prescribed on the hospital electronic prescribing system. This is commonly referred to as 'clerking' and is a paramount task in the admission of each patient. It provides practitioners with a holistic viewpoint in planning care and enables ongoing treatment for patients' established long-term conditions. Within the EAU, there is no standard time expectation for the completion of medication reconciliation by the medical team. In contrast, the hospital pharmacy team have a 24-hour time limit in which an accurate medication reconciliation, checking and verification must be completed for each new patient.

However, there is some flexibility in this target to allow for busy periods and due to the unpredictable nature of the department. Emergency medications are also prescribed electronically and are only dispensed to the patient once they are in the electronic system, with the exception of drugs administered from the crash trolley.

Delays in the availability of regular medications can disrupt a patient's routine, particularly if they have a long-term condition such as epilepsy and Parkinson's Disease, where timing of medications is important. Missed doses of regular medicines can lead to exacerbation of symptoms including; seizures, reduced functionality, and failure of physiological systems (Gerlach et al 2012, Manjunath et al 2009). As there is no defined standard time expectation for prescription medication reconciliation to be completed, patients, relatives and staff may have their own expectations of when prescription medications should be reconciled. Any perceived delay could lead to increased anxiety, frustration, distress and deterioration in symptoms. Furthermore, the uncertainty around expectations and can deny nursing staff the ability to reassure patients and may be perceived as being chaotic and unprofessional, which may leave the department more likely to receive complaints from patients, relatives and staff who hold their own expectation of what the standard should be. Patients may be uncertain of what is happening, which can lead to increased anxiety, frustration, and distress. Furthermore, this uncertainty can deny the nursing staff the ability to reassure patients and might be perceived as being chaotic and unprofessional.

A UK-based study investigated prescribing errors by medical staff for patients admitted to hospital as a result of collecting inadequate medication history and checking prescriptions with patients and found that almost half of the records reviewed had prescribing errors (Basey et al 2014). A second UK study found that only 75% of patients had accurate medications

resolution within 24 hours of admission to hospital (Iddles et al 2015). This improved to 86% after the implementation of an education programme for provision of access to the Emergency Care Summary for junior doctors. Further studies have demonstrated the importance and efficacy of medication reconciliation interventions for patients admitted to hospital which heavily use pharmacy staff (Pevnick et al 2018, Koehl et al 2019) and focus on those patients who are at high risk of adverse events (Mueller et al 2012) to reduce medication order errors and improve practices. One of these studies (Koehl et al 2019) found that implementation of a new pharmacist workflow system for patients admitted to an emergency observation department reduced the average prescription reconciliation time from 62 to 23 minutes. However, this study was based in a USA hospital setting and prescription reconciliation times are likely to vary between hospital settings and even within departments within a single hospital.

Although previous studies have focussed on interventions to improve the accuracy of medication reconciliation taken at admission, we were unable to identify any studies carried out within UK NHS emergency admissions departments which focused on determining a baseline time for prescription reconciliation completion. Prior to making any service improvements which aim to improve prescription reconciliation times within an EAU setting, it is important to establish the actual baseline waiting times.

Within the timeframe for our evaluation, patients within the EAU were clerked in an order based on a scoring system using the National Early Warning Score (NEWS) system (Jones 2012), a tool used to monitor patient's vital signs and identify the clinically unwell. It does this by scoring each measured observation on a scale of zero-three. A normal score is zero. Patients with a total score of over five are classed at higher risk and deemed to be more

clinically unwell. These patients are then prioritised for assessment and treated sooner. Whilst this protocol is in place to ensure that the sickest patients are seen first, it can lead to a longer wait and medication delay for other patients who have been scored as a lower priority.

Aims

The aims of our service evaluation were:

- To gain the perspectives of staff working on the EAU regarding the time patients wait for their medications to be prescribed (including their awareness of current practice and protocols)

To determine the time from admission to the EAU until medication reconciliation
To determine whether there was any time difference according to the day of admission.

Objectives

To achieve the study aims, our objectives were:

- To collate perceived average prescription reconciliation waiting times from EAU medical and nursing staff from a staff survey
- To determine actual waiting times for prescription reconciliation for all patients admitted to the EAU over the month of December through checking the hospital electronic record system and
- To determine any time differences according to the day of admission using statistical analyses.

Inclusion criteria

All medical and nursing staff who were on shift during a single weekday in December 2017 when the survey was administered were included in the evaluation. Retrospective data from

all patients admitted to the EAU during the month of December 2017 were included in the analysis.

Exclusion criteria

Patients admitted from the Ambulatory Care department with hand written prescription charts were excluded from the clinical patient audit, as these patients present with complete medication reconciliation. Patients admitted to a specialist department such as Intensive Care, Trauma and High Dependency directly from Accident and Emergency were not included in the data as they did not pass through the EAU.

Method

We adopted a two-staged approach to our service evaluation; combining a staff survey to collect staff perspectives and a clinical audit to determine actual waiting times for prescription medication reconciliation for all patients admitted to the EAU during the month of December. Our main question was “*How long do patients admitted to the EAU have to wait for their prescribed medications after their arrival to the unit?*”

An eight question survey developed by the authors (CE and CA), required respondents to record categorical, ordinal and free text qualitative responses – see Supplementary Materials. The paper survey was distributed to all staff on duty during a single 12 hour weekday shift by one of the authors (CE) and staff were asked to place completed surveys in a collection point on the unit during the shift. While informed consent was not obtained, the survey was completed anonymously as part of a service evaluation.

Quantitative data were analysed principally as counts data using contingency table methods. Prescription reconciliation times were positively skewed and reported as medians with quartiles, histograms and box-and-whisker plots as appropriate. One of the authors (CE)

coded and thematically analysed (Braun and Clark 2006) the qualitative data in the survey. The codes and themes were checked and agreed with a second author (CA) any and disagreements were resolved through discussion.

Staff perspectives

In order to gain a full team perspective of the topic, all 30 EAU medical and nursing staff who were on duty and providing care during a weekday in the month of December were invited to complete a short survey. The survey asked staff whether they were aware of any guidance relating to prescription medication reconciliation times; how long they perceived the average waiting time was for patients and whether they were aware of any guidance any implications to patients or staff as a result of time spent waiting for prescription reconciliation. Space was included in the survey for staff to make further free text responses. Staff were not provided with any information about practices, policies or protocols around this topic area during data collection.

Prescribed waiting times

One author (CE) reviewed the recorded times of patients arriving at the EAU through the month of December 2017, together with the time medication prescriptions were completed on the hospital's electronic prescribing system and calculated the prescription reconciliation time. To gather these data, we utilised the hospital electronic record facility selecting each patient file individually noting the date and arrival time of each patient. Next, we accessed the online prescription chart of the same patient and noted the date and time when medications were prescribed. Each patient was allocated a code to ensure anonymity and their prescription reconciliation times were stored spreadsheet.

Results

Staff survey

A 100% response rate (n=30) was achieved from the staff survey and the breakdown of staff groups can be seen in Figure 1. The median time that staff perceived patients had to wait for prescription reconciliation was 3 hours. When asked if members of staff were aware of any protocols or guidance relating to prescription times, 90% responded 'No', the remaining 10% stated 'Yes' but were unable to refer to any protocol or guidance when questioned further. Despite 40% of respondents initially stating they believed the department had efficient system in place, 90% then went on to say that the department was in need of improvement in this area. Almost half the respondents (47%) perceived a delay in medication reconciliation could result in exacerbation of patients' physical conditions.

-----Insert Figure 1 around here-----

The themes emerging from the coded qualitative open-ended responses within the staff survey were 'impact on quality of care' and 'improving efficiency' which are explored below:

Theme 1: Impact on quality of care

Staff raised specific concerns regarding the management of long-term physical health conditions, which require time sensitive medications, such as epilepsy, diabetes and Parkinson's Disease. They were concerned that there could be a '*deterioration of conditions [and] worsening symptoms of other underlying illness*' (Band 7 nurse) and believed it was particularly important that medications such as '*anti-epileptics and immunosuppressants*' (Consultant physician) should be dispensed in a timely manner. There was also concern that if regular medications had not been noted in a timely manner, potential drug interactions may not be spotted and acute medications may be prescribed inappropriately.

Several respondents raised concerns about the potential psychological impact to patients and relatives on waiting for regular medications and described a variety of emotions, including anxiety, distress and anger. One Band 5 nurse stated:

Patients get annoyed when they cannot have regular meds at the right time they would at home if they aren't prescribed.

This frustration could in turn, be directed towards staff, increasing work related stress and have a damaging effect on staff mental health and morale. One health care assistant had even noticed patients' relatives sometimes took it upon themselves to go home and return with their family member's regular medications as they were '*not happy at waiting*'. Associated with this, was the perceived impact that delays and complaints had on the reputation of the Trust and the staff therein, which was highlighted by a proportion of respondents. Some respondents indicated they were concerned about practical implications for the hospital such as prolonged admissions, thereby increasing risk of hospital acquired infections, delaying transport and adding to bed pressures.

Theme 2: Improving efficiency

The open-ended survey responses highlighted some potential facilitators to improve efficiency of prescription reconciliation for patients within the EAU. The ability to have streamlined access to patients' summary care record and GP records were seen as essential by several of the medical staff participants. Other potential ways of improving efficiency which were suggested by health care assistants included increased numbers of medical staff and for improved communication between staff and patients.

Clinical patient audit

During the month of December, 2017, 263 patients were admitted to the EAU. The median

time to prescriptions going live on the hospital electronic prescribing system was 2 hours and 48 minutes from arrival in the department. While 67% of prescriptions were resolved within 4 hours, 18% of patients waited for more than 6 hours. Fourteen percent waited for more than 8 hours and the longest delay was 22 hours 23 minutes from arrival in the department. A histogram detailing the frequency of time to prescription reconciliation can be seen in Figure 2. Figure 3 shows the time to prescription reconciliation for each individual patient plotted by admission time, and Figure 4 shows the time to prescription reconciliation on each day of the week. While there was some suggestion that prescriptions were reconciled more quickly on Mondays during this December period, there was little evidence to suggest systematic differences depending upon day of admittance.

-----Insert Figure 2 around here-----
-----Insert Figure 3 around here-----
-----Insert Figure 4 around here-----

Discussion

This study was completed by members of staff from the EAU in a large NHS teaching hospital in North-East of England. To our knowledge, this is the first study of its kind which captures both the perceptions of staff as well as objective measurements of waiting times for regular medications.

Data was gathered over the course of a month during what is referred to as ‘Winter Pressures’, considered the busiest time for hospitals with the largest number of admissions. This study therefore shows how the department functions at its peak times and gives an average time period based on a ‘worst case’ scenario.

The staff feedback questionnaire highlights that the majority of respondents believed there was room for improvement in the medication reconciliation process. A small number of staff claimed to be aware of guidance on acceptable time limits however they were unable to recall the names of these documents or policies. The staff survey was done without warning and as such, staff were unable to look for and read any relevant policies prior to completing the questionnaire. This was a strength of the study as it collected a first-hand opinion of the staff of their perception of the issue. An additional strength was that all medical and nursing staff who were on duty on the day the survey took place, completed the survey. Most staff highlighted the main consequence of delays in the medication reconciliation process, was an impact on patient safety. This concern for patient safety was mirrored in the literature (Basey et al 2014, Belda-Rustarazo et al 2015, Mekonnen et al 2016, Pevnick et al 2016). A previous systematic review (Mekonnen et al 2016) presented the use of pharmacist acquired medication reconciliation. Although this is traditionally the role of the junior medical team, this evaluation highlights the role of a pharmacist or pharmacy technician in improving the accuracy of medication reconciliation.

Our data demonstrated minimal differences in median prescription resolution times for day of admittance, with waiting times being slightly shorter for patients admitted on a Mondays. However, there were fewer patients admitted to the EAU on Mondays during the time our study was carried out, which could account for this slight variance.

Limitations

There are several limitations to our study. First, the data was only collected during the month of December— a month associated with winter pressures. There may be seasonal variations in

time to prescription reconciliation. Although we elicited staff perceptions and actual waiting times for prescription reconciliation, we did not identify any potential missed medication doses, prescription errors, or investigate any harm caused to patients, such as a deterioration in symptoms of long-term conditions, or worsening symptoms of acute ailments. These would warrant further investigation. Second, our short survey was not evaluated for test-retest reliability or validity. Further research could be performed to determine the reliability and validity of our survey. Finally, this service evaluation took place in a single busy hospital admissions department. While the sample size is quite small (n=30) it does represent a reasonably complete snapshot of a single hospital at a busy time of the year. Additional research is required to see if these delays in prescription reconciliation are shared across hospitals within and between Trusts. Given the importance of prescription reconciliation, the generalisability of these findings warrants further investigation.

Recommendations

Having now completed this evaluation, we recommend the following with the aim of improving the delivery of patient care on the EAU: Firstly, expand the role of pharmacy staff within the EAU to include medication reconciliation, this freeing up junior doctors for other tasks and thus improving the efficiency and speed of medication reconciliation; secondly, provide automatic access for EAU staff to patient records such as Single Point of Care, where medication prescribed by the patient's own GP and specialists is recorded and finally, we recommend a further study to explore any harm to patients as a result of prolonged waiting times for prescription medication reconciliation.

Conclusion

Our study has demonstrated that whilst the median time from arrival to the EAU until completion of medication reconciliation is just 2 hours 48 minutes, almost one fifth of patients had to wait for more than 6 hours and in one instance more than 23 hours from admission. This delay was far longer than any of the staff involved in the survey expected it to be. Unanimously the staff involved agreed that the system was not meeting the clinical needs of patients and should be improved. A potential solution for this could be the increased use of hospital pharmacy technician staff. A member of staff allocated to the EAU with this specific task would ensure safe and timely reconciliation of medicines and therefore lead to greater patient satisfaction of service and better patient care.

Implications for practice

- Expand the role of pharmacy staff to include medication reconciliation within the EAU
- Access to electronic patient records such as Single Point of Care to allow staff to view medications prescribed in both primary and secondary care.

Ethical Consideration and Consent

This study was undertaken as a service evaluation; therefore, NHS research ethics committee approval was not required. Permission to use data for the purposes of this piece of work was sought and obtained from the Trust Caldicott Guardian.

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Conflict of interest statement

The authors declare no conflict of interest.

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Figure Legends

Figure 1: Pie chart showing staff groupings of survey respondents

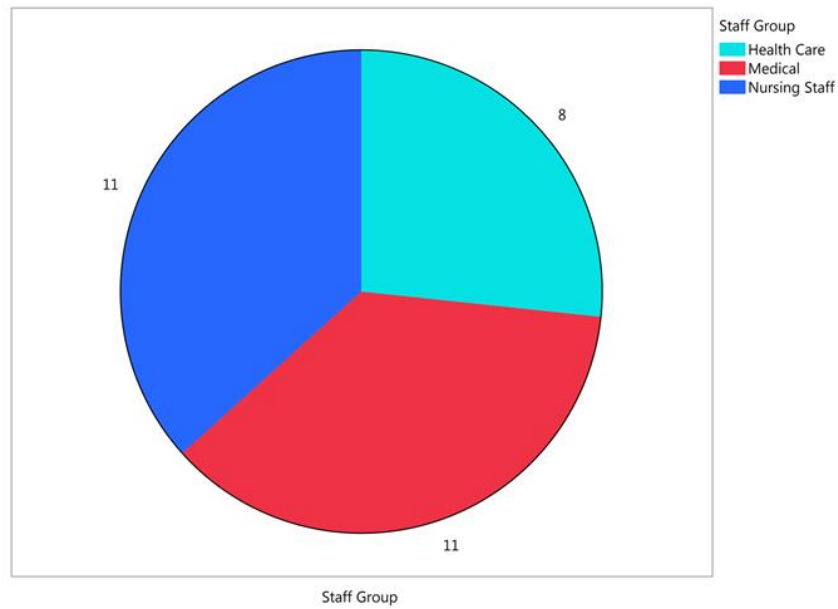


Figure 2: Histogram detailing time to prescription reconciliation for patients admitted the Emergency Assessment Unit over the month of December with median and interquartile ranges demarked

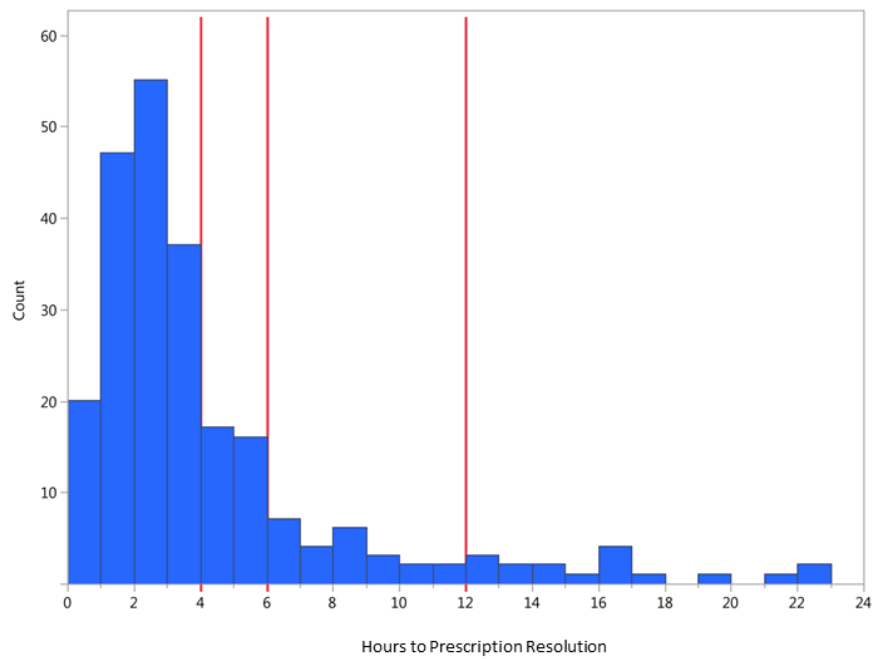


Figure 3: Plot detailing time to prescription reconciliation for each patient admitted during the month of December by admission time of day

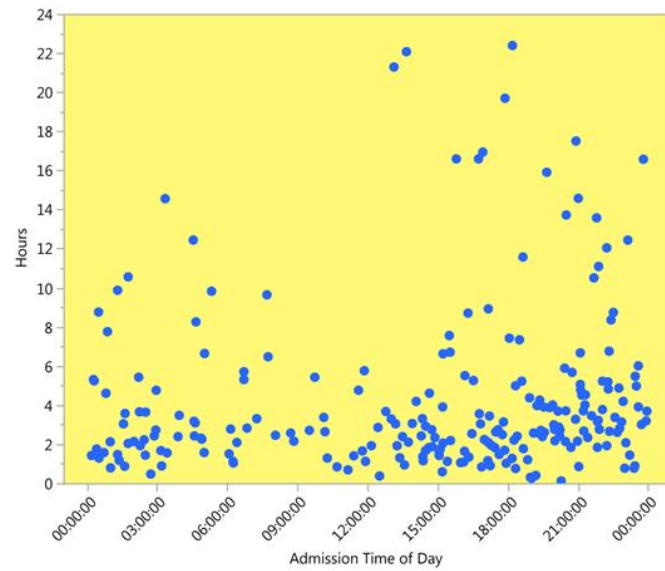
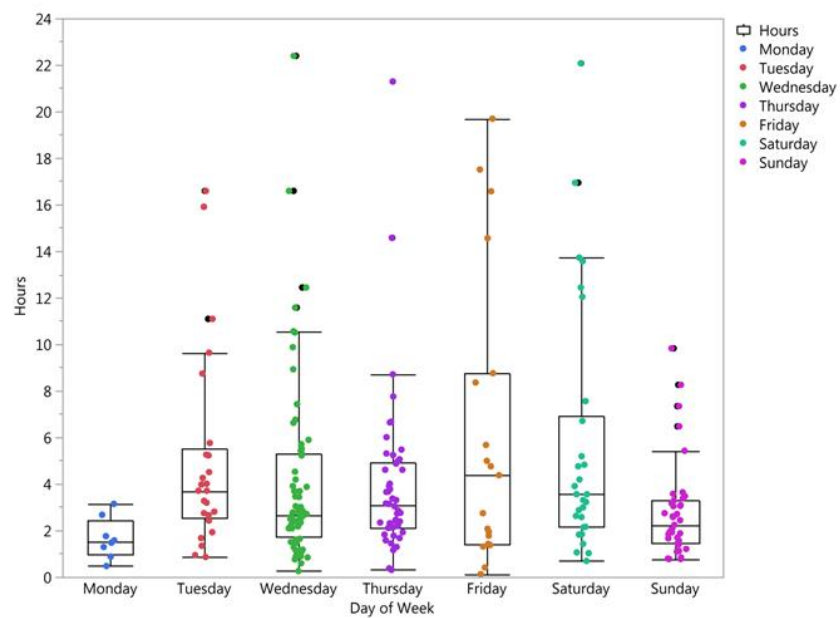


Figure 4: Box plots showing time to prescription reconciliation over the month of December by day of the week



Supplementary Materials A

EAU Staff questionnaire

By completing this questionnaire you are consenting for it to be used in the service evaluation asking the following research question:

What is the average length of time patients admitted to the EAU wait for having medications prescribed from their arrival to the unit and the potential implications of this?

All information will be kept in the strictest of confidence and disposed off following completion of the study. Approval for this study had been given by NHS Newcastle and the Caldicott guardian. Should you have any questions or wish further information please contact: Charlie.Ellison@nuth.nhs.uk.

Which Staff group do you belong to? (please circle)

<u>Medical</u>	<u>Nursing</u>
Physician Associate	Band 2
FY1	Band 3
FY2	Band 4
CT/ST	Band 5
SpR	Band 6
Consultant	Band 7
Other, please state:	Other, please state:

Are you aware of any guidance relating to how long patients should wait to have their regular medications prescribed on admission to the Assessment Suite?

(Please Circle) YES NO

If yes, What guidance? Please detail below.

What do you believe the average waiting time for medication prescriptions is? (Please Circle)

1Hour 2 Hours 3 Hours 4 Hours 5Hours 6 Hours 7+ Hours Don't Know

Would you agree that the Assessment Suite currently has an efficient system for obtaining and prescribing patient regular medicines in a timely manner?

(Please Circle) YES NO

If you have selected NO what could you recommend to improve this process? (Please detail below)

Do you feel there are any implications both to you professionally and/or the patients as a result of the time spent waiting for these prescriptions?

(Please Circle) YES NO

If yes what are these? (Please detail below)